

REMARKS

Claims 8-13 and 22-26 are now pending in the application. By this amendment, claim 8 is amended for the Examiner's consideration. Claims 22-26 are added for the Examiner's consideration. Support for claims 22-26 is found on page 6 and 7 of the specification. Claims 22-25 are directed to the elected species of Figure 4. No new matter is added. Applicants request reconsideration of the rejected claims in view of the above amendments and the following remarks.

Applicants submit that that above amendment should be entered into the record since it does not raise any new issues that need further search and/or consideration. The amendment to claim 8 includes the features of providing a linear flow control. This feature was already considered by the Examiner as evidenced on page 4 of the present office action. Additionally, the added claims are dependent claims which depend from a distinguishable base claim. A corresponding number of claims were previously canceled from the application. Applicants thus respectfully request entry of this amendment into the record and consideration of the amendment to claim 8.

§102(b) Rejection

Claims 8, 9 and 13 are rejected under 35 U.S.C. §102(b) over USPN 5,678,521 to Thompson et al. Claims 8, 9 and 13 are rejected under 35 U.S.C. §102(b) over USPN 5,197,438 to Yamamoto. These rejections are respectfully traversed.

The claimed invention is directed to a system used for variable pressure applications. The valves means of the invention are used to maintain a steady state control and smooth transition between different pressures; that is, a linear flow as shown in Figure 5 of the disclosure. Thus, by using the valve means of the present invention, it is now possible to control the hydraulic pressure within the merged line in a steady state between different pressures generated by either or both pumps.

Thompson

If an element is written as a means-plus-function element, the reference, in order to contain the element, must expressly or inherently perform a function identical to that of the means element, and the reference's structure for performing the function is equivalent to that disclosed in the subject specification. *In re Donaldson Company, Inc.*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994). MPEP § 2182. If there is no identity of function then the reference does not contain the element. *Id.* However, Applicants submit that the Thompson reference does not satisfy these requirements.

Thompson is directed to a valve and control system to maintain an adequate pressure within the accumulator. Thompson is not directed to maintaining a linear flow even with different pressures generated from different pumps. In particular, Thompson shows in Figure 1 and describes at col. 11 an assembly including one or more injection control valves 20 positioned along the fuel supply line from the accumulator 12 to the distributor 16. The injection control valve controls the timing and quantity of fuel injected into each engine cylinder in response to control signals received from an electronic control module (ECM) 13. Also, at least one pump control valve 18, 19 is positioned along the fuel supply line to pump 14 for controlling the amount of fuel delivered to accumulator 12 so as to maintain a desired fuel pressure in the accumulator 12. As disclosed at col. 13, by using the ECM 13 and pressure sensor 22, operation of pump control valves 18 and 19 can be controlled to ensure that accumulator 12 contains fuel at the proper pressure. But, Thompson does not address, for example,

... at least two valve means for regulating and maintaining a linear flow of fluid from the at least two pumps....

But more specifically a major teaching of Thompson is the use of the pump control valves 18 and 19 remaining either open or closed during stages of engine operation. The valves 18 and 19 are open so that fuel from low pressure supply pump 15 may be delivered during the downstroke of each pump 14. During the compression stroke of each pump 14, with pump

control valves 18 and 19 open, fuel will be forced back to low pressure supply pump 15 or to a drain (not shown) and returned to a fuel reservoir. If, however, it is desired to supply additional pressurized fuel to the accumulator 12, then pump control valve 18 or 19 will be closed during the compression stroke of the respective high pressure pump 14. With pump control valve 18 or 19 closed, pressure will build in the chamber of high pressure pump 14 until it is sufficiently great to overcome the pressure in accumulator 12 and thereby open the respective check valve 36. As high pressure pump 14 continues to pressurize the fuel, it will pass through check valve 36 and into high pressure accumulator 12. (See also cols. 13 and 14.) But, these valves 18, 19 and 36 do not function to provide a constant or linear flow control upstream from the pump. They are designed to ensure that the accumulator can be pressurized, as well as allow for pre-injection control.

Also, in the present invention, the check valves ensure that the pump in each respective line are not running against a low pressure of a valve of the at least one valve associated with the second stage which is in an "off" position in each of the respective lines. This also does not appear to be contemplated by Thompson. Instead, the check valves 36 of Thompson appear ensure that pressure generated from the pumps 14 remains with the accumulator 12.

Lastly, Thompson lists many different objects throughout the specification and most specifically at cols. 4-6. However, not one of these objects addresses the functions of the present invention. For this reason, additionally, Applicants submit that the Thompson reference does not contemplate the features or functions of the claimed invention. And, according to *In re Donaldson Company, Inc.*, if there is no identity of function then the reference does not contain the element.

In sum, Thompson does not show the identical function as the claimed invention. Thus, Thompson cannot anticipate the claimed invention.

Yamamoto

Yamamoto has an object to provide a variable discharge high pressure pump which can be electro-controlled to vary the discharge each time in dependence on the engine operation

condition or in accordance with the amount of fuel consumed from the common rail and which is so constructed as to reduce the leakage of the fuel from the high pressure pumping chamber into a low pressure section of the pump to thereby maintain the common rail pressure at a high pressure level. (See, col. 1, lines 55-64.) There is no identity of function with this object and the present invention.

Additionally, the Examiner is of the opinion that reference numeral 14 is a pump. This is inaccurate. Reference numeral 14 is a cylinder, as described at col. 4, line 28, for example. However, Figure 2 is actually directed to a single high pressure pump 7, where each of the cylinders is shown to have a pumping chamber 16. A valve 20 is in fluid communication with the pumping chamber and the rail 4 and acts as a discharge valve. In operation, each of the valves 22 include a valve member 21 which is adapted to be moved by the pressurized fuel in the pumping chamber 16 against a return spring in to an open position so that the pressurized fuel is discharged through a discharge port member 23 into the common rail. (See, col. 4, lines 49-59.) This is provided on a single line. On a different line from the discharge valve is a solenoid valve. Each of these valves have a low pressure passage 31 opened to the pumping chamber 16 and communicating at the other end of the low pressure section of the pump. This valve is designed to set the timing of the commencement of the pressuring operation of the plunger 15.

However, Yamamoto does not show at least two valve means being upstream from the at least two pumps in a respectively same line as the at least two pumps. Also, the valves of Yamamoto are not designed to regulate and maintain a linear flow control pressures generated from at least two pumps. Accordingly, Yamamoto does not show the identical function as the claimed invention, nor many of the same structural elements. Thus, Yamamoto cannot anticipate the claimed invention.

New Claims

Claims 22-26 are added for the Examiner's consideration. Claims 22-26 find support at pages 6 and 7 and in Figure 4, for example. The features of claims 22-26 are not disclosed in the Thompson reference.

Rejoinder

Applicants respectfully submit that claim 8 is an allowable generic claim. Accordingly, rejoinder of claims 10-12 is respectfully submitted as being proper.

Conclusion

In view of the foregoing amendments and remarks, Applicant submits that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicant hereby makes a written conditional petition for extension of time, if required.

Respectfully submitted,



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